CONFERENCES – INTERNATIONAL CONFERENCE (WORKSHOP)

International Seed Testing Association, Committee on Plant Diseases
Chairman: *Dr. Paul Neergaard*, Statens Plantetilsyn, Gersonsvej 13, Hellerup, Denmark

Report on

The Second International Conference on Seed Pathology

Convened by the Committee on Plant Diseases
of the International Seed Testing Association
at Scientific Services, Department of Agriculture, Edinburgh
25th June to 1st July, 1959

£1.3.6

CAB INTERNATIONAL
MYCOLOGICAL INSTITUTE
LIBRARY
IMI/CONF/1959 EDI

PDC 85
Copenhagen, August 1959

COMMONWEALTH MYCOLOGICAL INSTITUTE
3 MAR 1961

conf/1959 EDI

ISTA-PDC 85

SECOND INTERNATIONAL CONFERENCE ON SEED PATHOLOGY

convened by the Committee on Plant Diseases
of the International Seed Testing Association
at Scientific Services, Department of Agriculture,
Edinburgh,
25th June to 1st July, 1959.

Copenhagen
August, 1959.

CONTENTS

		Page:
1.	List of Participants	3
2.	Introduction	4
3.	The Organisation of International Comparative Seed Health Tests, 1959	5
4.	Results of the Comparative Seed Health Tests 1959	6
5.	Progress Towards Uniformity	7
6.	Research Programme	8
7.	Meeting of Members of the Committee on Plant Diseases of the International Seed Testing Association	9
8.	Future Plans	10
	Appendix	11
	Résumé	15
	Zusammenfassung	19

1.

LIST OF PARTICIPANTS

[x] Mrs. Alice M. Andersen, United States Department of Agriculture, Agricultural Research Center, Beltsville, Maryland, U.S.A.

[x] Dr. Claude Anselme, Station Centrale de Pathologie Vegetale, Versailles, France.

[x] Mr. John Baker, Ministry of Agriculture, Fisheries and Food, Plant Pathology Laboratory, Harpenden, England.

Dr. S. Batko, Forestry Commission Research Station, Surrey, England.

Dr. E. J. Doyle, Laboratory Section, Canada Department of Agriculture, Production and Marketing Branch

[x] Mrs. Maria de Lourdes Florencio, Ministerio da Economia, Servico de Ensaio de Sementes, Lisboa, Portugal.

Mr. Antonio Ferreira Florencio, Ministerio da Economia, Servico de Ensaio de Sementes, Lisboa, Portugal.

Miss S. Harrison, Research Branch, Seed Testing Station, Palmerston North, New Zealand.

Dr. O. L. Justice, United States Department of Agriculture, Agricultural Marketing Service, Washington D.C., U.S.A.

[x] Dr. A. V. Lithgow, Seed Testing Station, Palmerston North, New Zealand.

[x] Dr. J. P. Malone, The Queen's University, Botany Division, Belfast, Northern Ireland.

[x] Dr. F. Joan Moore, Ministry of Agriculture, Fisheries and Food, Plant Pathology Laboratory, Harpenden, England.

Dr. J. Mullin, Eire Department of Agriculture, Seed Testing Station, Dublin, Eire.

[x] Dr. Paul Neergaard, The Government Plant Protection Service, Copenhagen, Denmark.

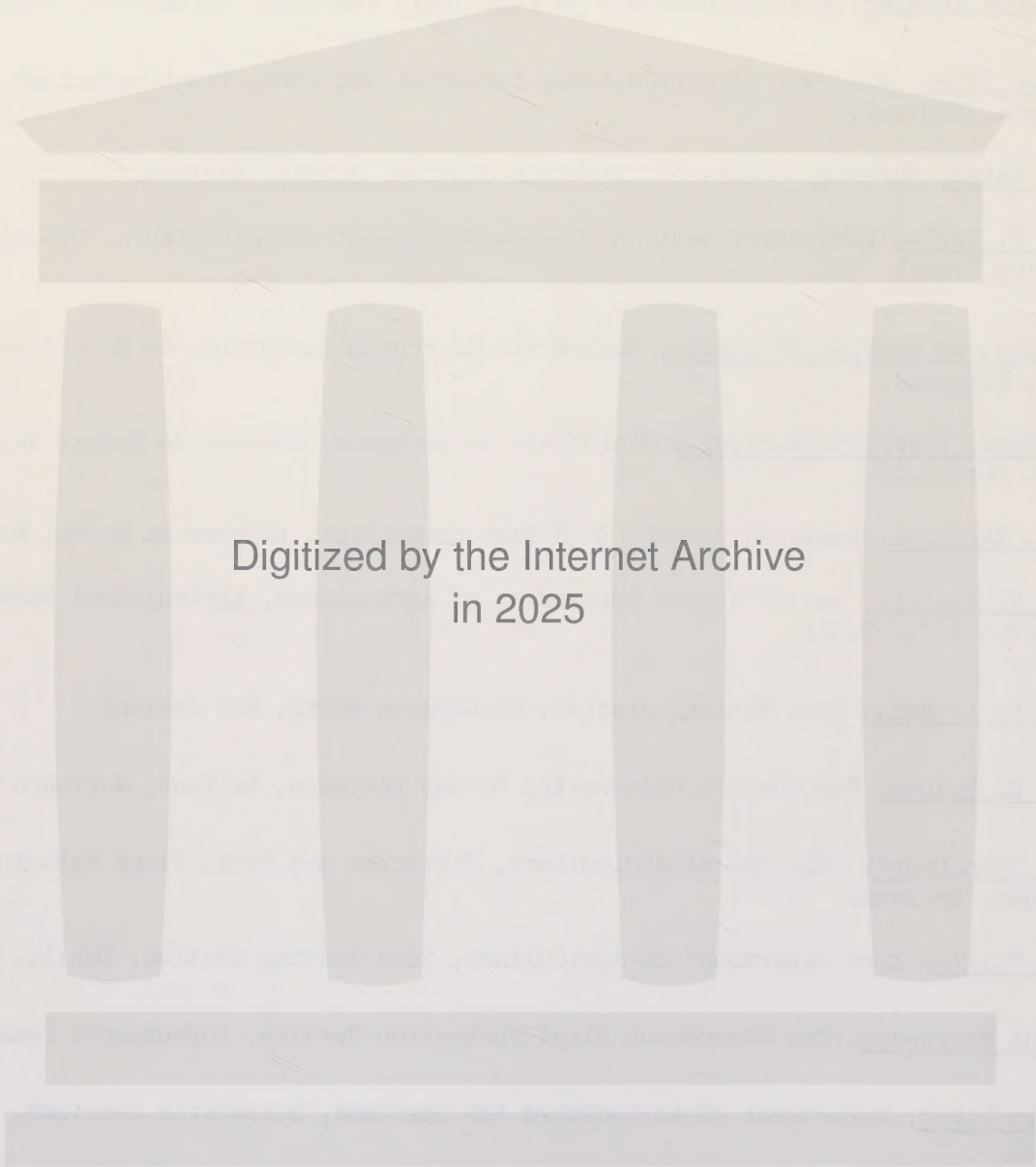
[x] Dr. Mary Noble, Department of Agriculture for Scotland, Scientific Services, Edinburgh, Scotland.

[x] Dr. J. de Tempe, Rijksproefstation voor Zaadcontrole, Wageningen, Holland.

[x] Dr. V. R. Wallen, Department of Agriculture, Science Service, Ottawa, Canada.

---

[x] Participated in comparative seed health tests 1959.



Digitized by the Internet Archive
in 2025

https://archive.org/details/international-seed-pathology_1959-08

2.

INTRODUCTION

One of the main results of the 1st International Conference on Seed Pathology, held in Cambridge from the 12th to the 17th May, 1958 was a general appreciation of the possibility of achieving uniformity in testing seed for diseases through application of appropriate methods. A need was felt to establish standard methods. The elaboration of these should be based on international comparative testing, the results of which should be fully discussed in international conferences where laboratory studies of the samples investigated could be arranged.

According to the desire of the Conference in Cambridge the chairman of the Committee, Dr. Paul Neergaard, therefore invited specialists on seed-borne diseases to participate a conference to be held at the Scientific Services of the Department of Agriculture for Scotland in Edinburgh from 25th June to 1st July, 1959.

A laboratory study of the 1959 referee samples was undertaken. Methods aiming at a specific analysis of seed-borne organisms were taken into consideration as well as methods adapted for the evaluation of the planting value of seeds, in appreciation of the different practical purposes of seed testing for health. The presence of experienced colleagues primarily interested in seed testing for germination and purity contributed essentially to the success of the discussions.

Thanks are due to the Director of Scientific Services, Dr. C. E. Foister, who unfortunately owing to illness was unable to attend, to Mr. W. H. Senior, Deputy Secretary of the Department of Agriculture for Scotland for opening the Conference and especially to Dr. Mary Noble and her colleagues in acknowledgement of their very efficient organisation of the conference.

3.

THE ORGANISATION OF INTERNATIONAL COMPARATIVE SEED HEALTH TESTS, 1959.

At the Conference convened by the Committee in Cambridge, May 1958, it was agreed that the number of samples of each seed species should be reduced and all stations asked to use at least two specified methods one of which, where appropriate, should be the standard one developed by the Committee.

According to a desire expressed by the meeting the following samples were sent out:

1 sample of Avena sativa (3 common methods) supplied by Edinburgh.

1 sample of Hordeum vulgare (3 common methods) supplied by Wageningen.

1 sample of Linum usitatissimum (2 common methods) supplied by Edinburgh, Copenhagen and Statens Växtskyddsanstalt, Stockholm (mixed sample).

1 sample of Medicago lupulina (2 common methods) supplied by Cambridge.

1 sample of Trifolium incarnatum (2 common methods) supplied by Corvallis, Oregon.

1 sample of Triticum vulgare (3 common methods) supplied by Edinburgh.

1 sample of Zinnia elegans (3 common methods) supplied by Copenhagen.

Descriptions on the suggested common methods and recording sheets that enabled a more uniform recording were furthermore distributed.

Besides the common methods the co-operating stations were asked to use other methods and it was recommended that each station should use at least its own method applied for the seed species and diseases in question.

The referee samples were distributed to 21 stations and results were received from the following 17 stations:

Plant Pathology Division, Queen's University, Belfast, Northern Ireland.

U.S. Department of Agriculture, Biological Science Branch, Beltsville, Maryland, U.S.A.

The Commonwealth Department of Health, Canberra, Australia.

The Government Plant Protection Service, Copenhagen, Denmark.

The Oregon State College, Corvallis, Oregon, U.S.A.

The Department of Agriculture, Plant Pathology Section, Edinburgh, Scotland.

The Department of Agriculture, Experimental Station, Geneva, New York, U.S.A.

Ministry of Agriculture, Fisheries and Food, Plant Pathology Laboratory, Harpenden, England.

U.S. Department of Agriculture, Plant Quarantine Division, Hoboken, New Jersey, U.S.A.

Ministerio da Economia, Servico de Ensaio de Sementes, Lisbon, Portugal.

The University of California, Division of Plant Pathology, Los Angeles, California, U.S.A.

The Department of Agriculture, Plant Pathology Laboratory, Ottawa, Canada.

The Department of Agriculture, Seed Testing Station, Palmerston North, New Zealand.

The Agricultural Research Station, Rehovot, Israel.

Rijksproefstation voor Zaadcontrole, Wageningen, Holland.

Centre National de Recherches Agronomiques, Versailles, France.

Bundesanstalt für Pflanzenbau und Samenprüfung, Vienna, Austria.

4.

RESULTS OF THE COMPARATIVE SEED HEALTH TESTS 1959

The results supplied by all the participating stations together with their comments on the standard methods and observations on supplementary tests had been co-ordinated and duplicated and copies were sent out to all participants and were available for everyone present at the meeting. Discussion on the results and over repeat counts on samples in the laboratory during the meeting revealed explanations for many of the discrepancies. A summary of the results, with particular emphasis on the degree of uniformity achieved with the different methods, is given in the Appendix. Interesting features of tests have also been noted.

On this year's results it appears that the malt agar plating method was satisfactory and slightly to be preferred to plating on potato dextrose agar for the detection of Fusarium nivale and Helminthosporium avenae on oats and F. nivale and Septoria nodorum on wheat. The brickstone method also used on these pathogens was considered to give additional useful information on the possible field performance of the sample. For Helminthosporium sativum on barley the potato dextrose agar plating method and blotter test were equally satisfactory. For the flax pathogens malt agar plating was more reliable than the blotter test for Phoma sp. and Botrytis cinerea but both tests gave rise to difficulties with Alternaria linicola. Consistently higher counts of Ascochyta imperfecta were obtained using the blotter test compared with malt agar plating. For Alternaria zinniae blotter tests with or without 2,4-D were undoubtedly preferable to agar plating. The potato dextrose agar plating method gave higher figures than blotter test for Fusarium roseum on crimson clover.

5.

PROGRESS TOWARDS UNIFORMITY

In evaluating the main factors responsible for the differences in the recorded results there appeared to be no evidence that there had been any appreciable variation between the samples, in the temperature condition or, in general, in the time of incubation. The main reasons for the differences are considered below.

a) Experience

The most significant cause of variation was undoubtedly the personal element in recognising the fungi, in distinguishing between pathogens and saprophytes with similar cultural characters and in assessing, for record purposes, slight infections or limited growth on agar plates. In general the agreement between the more experienced stations, and particularly those represented at the Cambridge meeting, was gratifyingly good. The referee samples were all of north western European origin and many of the stations outside this area had never before handled several of the fungi.

The laboratory facilities and time allocated for examination of duplicate reference samples on test during the meeting allowing the exchange of experiences with acknowledged experts provided an unrivalled opportunity for the participants to reach a measure of uniformity that could not have been achieved in any other way. The value of such a meeting was once again acclaimed by all the participants.

Appreciating the value of colour transparencies in providing a permanent record of symptoms and colony characteristics a catalogue has been compiled of transparencies of which copies are now available. This will be circulated to all stations noted in the Committee's Directory of Seed Pathologists. Additional lists from other stations would be welcomed.

b) Media

Variations in the colour and composition of the media used for agar plating methods using natural materials such as malt and potatoes were considered to be of importance. Observations made at Edinburgh showed that several malt preparations differing in diastatic value were available (the one generally recommended was of low diastatic value) and it was suggested that if a suitable synthetic medium could be found this source of variation could be overcome and incidentally might be more universally obtainable. A demonstration of a number of fungi, including Fusarium nivale, Fusarium roseum, Epicoccum sp., Septoria nodorum, Septoria avenae and Helminthosporium avenae on agar plates with malts of high and low diastatic values, with Czapek's medium and with two synthetic malts (one with an inorganic source of nitrogen and the other with an organic nitrogen) served to illustrate the differences in appear-

ance of the fungi, and in their growth rates on the different media. Further work on this aspect is obviously desirable.

c) Blotter Tests

Supplementary tests made at Wageningen showed that light was essential for the development of symptoms, or sometimes of fructification of certain fungi, especially Fusarium spp. and Helminthosporium avenae and counts made under the two conditions differed markedly. Most of the other pathogens included in the tests were apparently unaffected. About half the stations had kept their blotter tests in the light and half in the dark: it was agreed that in future these conditions should be specified.

c) Brickstone Tests

Most of the stations doing this test had used red brickstone but the use by two, of vermiculite with reasonably good results suggested that other materials might be substituted. The red brickstone has the disadvantage that it tends to cause slight discolouration rather similar to the Fusarium damage for which the test is made.

6.

RESEARCH PROGRAMME

Research on various subjects of urgent importance to seed health was suggested and accepted to be carried out by some of the stations represented. The following subjects were discussed in this connection:

Media: Investigations on the influence of synthetic media as against media of natural sources on the colony appearance of seed-borne organisms; on the possibility of substituting Perlite for brickstone in the Hiltner method.

Diseases: Investigations on routine testing methods for blind seed disease of ryegrass; for pasmo disease of flax; and comparison of methods already available for loose smut of barley.

Forest seed: Investigations on occurrence of seed-borne fungi on forest seeds and the question of their parasitism as against saprophytism..

The desirability of collaboration on specific research schemes and specialists on seed-borne nematodes and viruses and bacteria was also endorsed by the Committee.

7.

MEETING OF MEMBERS OF THE COMMITTEE ON PLANT DISEASES OF THE INTERNATIONAL SEED TESTING ASSOCIATION.

A. The Handbook on Seed Health Testing, published under the responsibility of the ISTA.

In a closed meeting the editorial sub-committee discussed editorial principles in detail. It was decided to divide the handbook into two "volumes" or "series" of monographs.

The first of these series should deal with general reviews of the literature on seed-borne diseases. A preface and an introductory chapter is in print, an annotated list of seed-borne diseases has been published and the next chapters should include reviews of the literature on (1) methods of seed health testing, (2) pesticides in relation to seed health testing and (3) seed weakness.

The second series of the handbook monographs should be published as leaflets dealing with individual diseases or methods, e.g., one monograph on Alternaria linicola on flax, one on Phoma lingam on Brassicae, one on the agar plating method as used for flax diseases. This principle would facilitate the collaboration of specialists on single diseases and the issue of new editions of the monographs when needed. In a meeting of all attending members of the Committee this scheme was supported.

B. The EPPO Working Parties on Seed-borne Diseases

The list on important seed-borne diseases included in the Reports of the EPPO Working Parties on Seed-borne Diseases on crops of temperate climates, in Paris 1954 and on Sub-tropical or tropical crops in Paris 1958 were dealt with. Discussion was taken up disease by disease. The list of specialists drawn up at Cambridge was reviewed and further suggestions made on a programme of co-operation with specialists on the diseases concerned in order to suggest workable standard routine methods, if possible.

C. The International Rules for Seed Testing

A preliminary proposal dealing with the introductory paragraphs of the sections on diseases in the Rules was presented by Dr. J. de Tempe and met with general provisional approval. In further discussion a general desire for a more radical review of the special parts of this section was expressed.

8.

FUTURE PLANS

1. Comparative tests of some of the seed species already studied should be repeated, e.g. barley (Hordeum vulgare), wheat (Triticum vulgare) and carrot (Daucus carota).

As a new subject for such tests pea (Pisum sativum) was suggested.

2. Co-operation with the association-wide comparative testing scheme for germination was recommended. Trefoil (Medicago lupulina) infected by Ascochyta imperfecta was mentioned as a suitable subject.

3. The conference approved the initiation of a scheme of comparative seed health testing of subtropical and tropical crops of importance in the middle East, e.g. maize (Zea mais) and rice (Oryza sativa). This work would be facilitated by the circumstances of the chairman having been appointed Professor of Seed Technology and Plant Pathology at the American University at Beirut, Lebanon.

4. The conference agreed to encourage research on a number of problems pertaining to development of routine seed health testing methods, as detailed above in the section dealing with research.

5. Further co-operation between the Plant Diseases Committee and other organisations such as the European and Mediterranean Plant Protection Organisation (EPPO) and the Food and Agriculture Organisation of the United Nations (FAO) may be expected. Technical help may be needed in order to meet the practical demands in this connection. The Conference agreed to give full support to the FAO World Seed Year.

6. The Conference recommended that the next meetings should be held, if possible, in Beirut in Spring 1960 and in Versailles, France in May or June 1961.

APPENDIX

The following is a summary of the results of the referee tests. The record sheets returned by the participating stations included counts on the occurrence of many saprophytes as well as the pathogens. While it was helpful to have these to check on possible confusions only the figures for the main pathogens have been included. In determining the figure taken as the approximate level of infection all the relevant information from the results, the discussions and counts made at the meeting were taken into consideration.

AVENA SATIVA

Two agar plate methods (malt and potato dextrose agar, with surface disinfection and examination after 6 days) were compared. The pathogens present were Fusarium nivale and Helminthosporium avenae.

		Level of infection (approx %)	No. of stations recording this %	total
MALT	F. nivale	35 - 45	6	11
	H. avenae	30 - 40	4	
PDA	F. nivale	30 - 40	4	11
	H. avenae	30 - 40	3	

Some stations had undoubtedly confused H. avenae with Alternaria tenuis and others failed to record very slight amounts of the fairly characteristic mycelium of this fungus. Fusarium nivale had not been seen by the American stations previously. The saprophyte Acremoniella atra was troublesome not only as a fast growing contaminant but also in changing the appearance of some of the colonies it had overgrown.

Although the distinction between Epicoccum sp. and F. roseum was easier on potato dextrose agar, most other fungi grew faster on this medium than on malt and counts were more difficult. The figures were slightly but consistently higher on malt.

The brickstone method (with examination after 14 days) was also used on this sample. Of the 6 stations making the test 4 recorded 20-30% pre-emergence blight, 3 noted 30-40% Fusarium spp. and 3, 10-20% H. avenae.

HORDEUM VULGARE

An agar plating method (potato dextrose agar with surface disinfection and examination after 6 days) was compared with a blotter test (6 days). The pathogen detected was Helminthosporium sativum.

	Level of infection (approx %)	No of stations recording this %	total
PDA	5 - 15	14	14
BLOTTER	5 - 15	11	15

Two stations also used plating on to malt with surface disinfection and obtained similar results to those recorded for potato dextrose agar.

A Sodium hydroxide soak method for the detection of loose smut (Ustilago nuda) was also used on this sample by 10 stations. Very little infection was present; 5 stations recorded a trace to 1% and 5 did not find any.

LINUM USITATISSIMUM

Comparisons were made between agar plating (malt, examined after 5 days) and blotter test (examined after 12 days). Three pathogens were found, Phoma sp., Botrytis cinerea and Alternaria linicola.

		Level of infection (approx %)	No of stations recording this %	total
MALT	Phoma sp.	15 - 25	12	15
	B. cinerea	1 - 10	12	
	A. linicola	25 - 35	6	
BLOTTER	Phoma sp.	15 - 25	7	14
	B. cinerea	1 - 10	11	
	A. linicola	8 - 18	5	

The determination of A. linicola was difficult in both tests; on malt it was confused with A. tenuis and on blotters sporulation was sparse in the time allowed for the test.

One station used a malt agar plate method with surface disinfection and occasional ultra violet irradiation and recorded, after ten days 38% A. linicola and 19% Phoma sp.

MEDICAGO LUPULINA

An agar plating method (malt, examined after 7 days) was compared with blotter test (examination after 7 days) for detection of Ascochyta imperfecta.

	Level of infection (approx %)	No of stations recording this %	total
MALT	20 - 30	4	14
	30 - 40	5	
	40 - 50	2	
BLOTTER	20 - 30	4	13
	30 - 40	1	
	40 - 50	5	

The variation with these tests was considerable. High bacterial contamination was encountered with this sample. One station using malt agar plating but with surface disinfection recorded 26% infection after 10 days. Some spread may have occurred on the blotters.

It is of interest to note that sclerotia of Sclerotinia sclerotiorum had been found in the bulk of the seed used for the test and one station recorded the development of this fungus from a few seeds.

TRIFOLIUM INCARNATUM

Comparison between agar plating (potato dextrose agar, 7 days) and blotter test (7 days); Fusarium roseum of unknown pathogenic status was present.

	Level of infection (approx %)	No of stations recording this %	total
PDA	20 - 30	10	15
BLOTTER	10 - 20	5	15

The fungus was difficult to detect on blotters and most counts were under 10%. At two stations the agar plate method was used but with surface disinfection and counts of Fusarium spp. were reduced to below 10% indicating that much of the infection was superficial.

At one station one seedling on a blotter was found to be infected with Kabatiella caulivora.

TRITICUM VULGARE

Two agar plating methods (malt and potato dextrose, with surface disinfection and examined after 6 days) were compared. The main pathogens present were Fusarium nivale and Septoria nodorum.

		Level of infection (approx %)	No of stations recording this %	total
PDA	F. nivale	15 - 25	6	11
		20 - 30	4	
	S. nodorum	30 - 40	5	

		Level of infection (approx %)	No of stations recording this %	total
MALT	F. nivale	20 - 30	7	11
	S. nodorum	30 - 40	8	

As with the oat sample counts in potato dextrose were not so easy as on malt particularly with F. nivale and figures were consistently lower.

The brickstone method was used by 5 stations; 3 recorded 15 - 25% Fusarium spp. and 3 30 - 40% S. nodorum in addition to considerable amounts of pre-emergence blight.

Two stations using blotters and rolled filter paper respectively, and recording after 14 days both obtained approximately 64% S. nodorum and 18% Fusarium spp.

ZINNIA ELEGANS

Agar plating (malt, examined after 6 days) was compared with blotter tests with and without 2,4-D added to the water (7 days). The main pathogen present was Alternaria zinniae; Fusarium moniliforme was also present on many if not all of the seeds.

	Level of infection (approx %)	No of stations recording this %	total
BLOTTER with 2,4-D	50 - 60	7	16
	40 - 50	2	
BLOTTER without 2,4-D	50 - 60	7	16
	40 - 50	5	

On the agar plates A. zinniae could not be distinguished from A. tenuis which was very prevalent in this sample. At many stations heavy contamination with Rhizopus sp. made recording impossible or very difficult.

There was no evidence that 2,4-D interfered with sporulation of A. zinniae; the seeds were easier to examine where this chemical had been used to depress the sprouting.

RÉSUMÉ

Introduction. L'un des principaux resultats de la première conférence internationale sur les parasites transmis par les semences qui s'est tenue à Cambridge du 12 au 17 Mai 1958 fut un accord général sur la possibilité d'aboutir à l'uniformisation des méthodes d'analyse sanitaire des semences, d'ou la necessité d'établir des methodes standards.

La mise au point de ces dernières devoit être basée sur des essais comparatifs internationaux dont les résultats seraient discutés en détail lors de conférences internationales ou les études de laboratoires des échantillons étudiés, pourraient être presentées.

Une étude des échantillons de réference fut effectuée à Edimbourg en 1959. Des méthodes ayant pour but de réaliser une analyse spécifique des organismes transmis par les semences furent considérées, ainsi que les méthodes permettant d'évaluer le compartement en culture des semences, et ceci, par l'appreciation de leurs valeur pratique d'aprés les analyses sanitaires. La présence a cette conférence de spécialistes intéressés au premier chef par les essais de semences concernant la germination et la pureté à particulièrement contribué au succés des discussions.

Organisation des tests d'analyse sanitaire en 1959. Un échantillon de chacune des especes suivantes de semences fut adressé aux diverses stations.

Avena sativa (3 méthodes classiques), Hordeum vulgare (3 méthodes classiques), Linum usitatissimum (2 méthodes classiques), Medicago lupulina (2 méthodes classiques), Trifolium incarnatum (2 méthodes classiques), Triticum vulgare (3 méthodes classiques) et Zinnia elegans (3 méthodes classiques).

Les échantillons de référence furent envoyés a 21 stations et les résultats reçus de 17 stations. Un rapport de ces résultats a été étudié par le Président du comité.

Résultats des tests comparatifs d'analyse sanitaire des semences pour 1959. Les résultats et commentaires sur les méthodes standards et les observations concernant les tests supplémentaires réalisés, furent discutés. Des comptages repétés sur les échantillons au laboratoire pendant la conférence donnérent des explications de la plupart des différences observées.

Une résumé des résultats est donné dans l'appendice ou l'on insiste plus particulièrement sur le degré d'uniformité obtenu avec les différentes méthodes.

Tendance vers l'uniformisation des méthodes. La cause éssentielle de variation est indubitablement l'élément personnel dans la déterminations des champignons entre organismes pathogènes et saprophytes présentant des caractères culturaux identiques et en ténant compte au cours des notations des légères infections et des organismes a croissance limitée sur les boites gélosées.

D'une façon générale l'accord entre les stations les plus expérimentées et particulièrement celles deja répresentées à la conférence de Cambridge fut assez bon.

Les échantillons de référence provenaient tous de l'Europe du Nord-Ouest et la plupart des stations situées en dehors de cette aire géographique n'avaient jamais en l'occasion d'observer certains des champignons présents.

Les facilités données par le laboratoire et le temps alloué a l'examen de multiples échantillons de référence analysés pendant la conférence, a permis des échanges fructueux entre les experts agrées, et a donné la possibilité aux participants d'envisager l'uniformisation des méthodes analyse. De tels échanges n'auraient pu être obtenue par aucun autre moyen. L'efficacité de telles réunions fut une fois de plus reconnue par tous les participants.

Une série de diapositifs en couleur a été examinée et a permis de donner une base permanente au diagnostic des symptomes et a l'établissement des caractéristiques des colonies. Un catalogue des diapositifs a été établé dont les copies sont mainténant valables. Celleci seront mises a la disposition de toutes les stations adhérentes au Comité Directeur.

Des listes additives en provenance d'autres stations seraient les bienvenues.

Les variations observées dans la couleur et la composition des milieux a base de gélose nutritive compenant des éléments naturels tels le malt et la pomme-de-terre furent considérées comme particulièrement importantes.

La nécessité s'est fait sentir d'étudier des milieux synthétiques, utilisables pour la méthode des boites de Petri gélosées.

Des expériences supplementaires faites a Wageningen ont montrè que la lumière jouait un role dans la manifestation des symptomes et quelquefois sur la fructification de certains champignons. La plupart des stations ayant utilisé le test de Hiltner se sont services de brique rouge concassée, le fait que deux d'entre elles aient utilisées la vermiculite avec d'assez bon résultats laisse à penser que d'autres matériaux pourraient être également employés. La brique rouge présenterait l'inconvénient de provoquer de légères decolorations quelque peu semblables aux dégats de Fusarium pour la recherche duquel le test est réalise.

Programme de recherche. On a suggêré que des recherches soient entreprise sur des sujets variés d'importance urgente pour l'etat sanitaire des semences. Certaines stations répresentées ont accepté de les étudier.

Les sujets suivant furent retenus:

Recherche sur l'influence des milieux synthétiques comparée aux milieux à base de pro-

duits naturels sur l'aspect des colonies; sur la possibilité de substituer la Peralite a la lirique dans le test de Hiltner; recherches sur les méthodes d'analyse de routine à l'égard d'une maladie des semences de ray-grass (blind seed), le pasmo du lin et le charbon nu de l'orge; recherches sur les champignons parasites ou saprophytes portes par les semences d'arbres forestiers.

La possibilité d'avoir la collaboration de spécialistes sur des thèmes de recherches specifique tels que les nématodes portés par les semences, la virologie ou la bacteriologie fut également évoquée par le comité.

Manuel d'analyse sanitaire des semences. Publié sous la responsabilité de l'ISTA.

Au cours d'une réunion restreinte le sous-comité en a discuté les principes en détail. Il fut décidé de diviser le manuel en 2 "volumes" ou "series" de monographies.

La première de ces séries comprendrait, une revue générale de la litterature concernant les maladies transmises par les semences tandis que la deuxième série serait publiée en tires à part et concernerait plus particulièrement les maladies et les méthodes d'analyses traitées séparament.

Les séances de travail de l'EPPO sur les maladies transmises par les semences. Les listes de maladies importantes transmises par les semences établiés dans les rapports des séances de travail de l'EPPO qui se sont ténues à Paris, en 1954 sur les cultures des régions tempérées, et en 1958 sur les cultures des régions tropicales et subtropicales ont été également considérées. La discussion fut réalisée maladie par maladie. La liste des spécialistes établie à Cambridge fut révisée et d'autres suggestions faites sur ur programme de coopération avec les spécialistes des maladies en question dans le but que des méthodes standards de travail de routine soient si possible envisagées.

Les régles internationales d'analyse de semences. Une proposition préliminaire se rapportant aux différents paragraphes d'introduction des sections sur les maladies fut présentée par le Dr. J. de Tempe et obtint une approbation provisoire d'ordre général. Dans la discussion qui s'ensuivit l'ensemble des personnes présentes émit le désir qu'une étude approfondie, concernant certaines suggestions particulières soit réalisée.

Programme d'avenir. Différentes analyses comparatives sont suggérées sur l'orge (Hordeum vulgare), blê (Triticum vulgare), carotte (Daucus carota) et pois (Pisum sativum)

Une coopération avec les organismes réalisant des tests comparatifs de germination fut jugée souhaitable, et les semences de Medicago lupulina furent agreées comme matériel pour réaliser ces études.

La conférence approve l'initiative d'un programme d'analyses sanitaires de semences comparatives de cultures tropicales et subtropicales importantes dans le Moyen Orient à

savoir le Maïs et le Riz. La conférence donne son accord pour encourager les recherches entreprises sur les problemes destinés a developper les méthodes d'analyse sanitaire des semences.

Une coopération ultérieure entre le comité et d'autres organisations telle que l'Organisation Européenne et Mediterranéenne de Protection de Plantes et la FAO aux Etats Unis est envisagés.

Une aide technique pourrait être nécessaire pour faire face aux demands pratiques dans ce domaine.

Les membres de la conférence sont d'accord pour donner leur appui total a l'organisation de "l'année mondiale des semences" organisée par la FAO.

La conférence a prévu que la prochaine réunion se tiendrait si possible à Beyrouth au printemps 1960 et à Versailles en Mai ou Juin 1961.

ZUSAMMENFASSUNG

Einleitung. Eines der wichtigsten Ergebnisse der 1. Internationalen Konferenz über Samenpathologie, abgehalten in Cambridge vom 12. - 17. Mai, 1958, war die allgemeine Übereinstimmung über die Möglichkeit, dass eine Gleichmässigkeit in der Prüfung von Samenkrankheiten durch die Anwendung von entsprechenden Methoden erreicht werden kann. Man war auch der Meinung, dass noch Standartmethoden fehlten. Die sorgfältige Ausarbeitung solcher Methoden sollte auf internationalen Vergleichsprüfungen fussen, deren Ergebnisse in internationalen Konferenzen erschöpfend diskutiert werden sollten, an Orten, wo eine laboratoriumsmässige Behandlung der betreffenden Muster eingerichtet werden kann.

So wurde denn eine labormässige Prüfung der Vergleichsuntersuchungen 1959 in Edinburgh durchgeführt. In Anwendung des verschiedenartigen praktischen Zweckes der Gesundheitsprüfung wurden sowohl Methoden, die eine spezifische Analyse der samenbürtigen Organismen erzielen, als auch geeignete Methoden für die Erkennung des Anbauwertes der Samen in Betracht gezogen. Die Anwesenheit von erfahrenen Kollegen, die in erster Linie für die Keimfähigkeits- und Reinheitsprüfung Interesse haben, trug wesentlich zum Erfolg der Diskussion bei.

Organisation der Gesundheitsprüfung 1959. Je ein Muster folgender Samenarten wurde ausgeschickt: Avena sativa (3 Methoden), Hordeum vulgare (3 Methoden), Linum usitatissimum (2 Methoden), Medicago lupulina (2 Methoden), Trifolium incarnatum (2 Methoden), Triticum vulgare (3 Methoden) und Zinnia elegans (3 Methoden).

Die Vergleichsmuster wurden an 21 Stationen verteilt, von denen 17 Ergebnisse schickten. Ein Bericht über die Ergebnisse wurde vom Vorsitzenden des Komitees zusammengestellt.

Ergebnisse der Vergleichsuntersuchungen 1959. Es wurden die Resultate, Bemerkungen zu den Standart-Methoden und Beobachtungen bei den Ergänzungsprüfungen besprochen. Wiederholtes Auszählen an den Mustern im Labor während des Treffens ergab Erklärungen für viele der Widersprüche. Eine Zusammenfassung der Resultate, wobei ein besonderes Gewicht auf den Grad der Gleichmässigkeit gelegt wurde, die mit den verschiedenen Methoden zu erreichen war, ist im Anhang zu finden.

Fortschritte im Hinblick auf die Gleichmässigkeit. Die bedeutsamste Ursache der Abweichung war zweifelsohne die Subjektivität in der Erkennung der Pilze, im Unterscheiden zwischen Krankheitserregern sowie Saprophyten mit ähnlichem Verhalten in Kulturen und in der Festlegung von schwacher Infektion oder begrenztem Wachstum auf Agar-Platten für Berichtzwecke. Im Allgemeinen war die Übereinstimmung zwischen den mehr geübten Stationen erfreulicherweise gut. Die Vergleichsmuster waren alle nordwesteuropäischer Herkunft und viele der Stationen ausserhalb dieses Bereiches hatten mit mehreren dieser Pilze niemals zuvor zu tun gehabt. Das Treffen bot durch seine laboratoriumsmässige Behandlung der Doppelproben, zu deren Prüfung genügend Zeit zur Verfügung stand und den Austausch von Erfahrungen mit kundigen Fachleuten die geplante wirklich hervorragende Möglichkeit, dass die Teilnehmer eine Uniformität in der Beurteilung erreichen konnten, wie sie anders wohl nicht möglich gewesen wäre. Der Wert eines solchen Treffens war wieder einmal von allen Teilnehmern bestätigt worden.

Auf Grund der allgemeinen Ansicht über den Wert von Farb-Diapositiven für ein dauerndes Festhalten von Symptomen und charakteristischen Kolonien wurde ein Katalog von Diapositiven zusammengestellt, deren Kopien nun zu haben sind. Dieser wird allen Stationen zugehen, die auf der vom Komitee aufgestellten Liste der Samen-Pathologen aufscheinen. Zusätzliche Stationen würden willkommen sein.

Abweichungen in der Farbe und Zusammensetzung des Mediums für die Agarplatten-Methoden, wo natürliches Material wie Malz und Kartoffeln verwendet werden, wurden als wesentlich angesehen.

Es besteht ein Mangel an Studien über synthetische Mittel für die Agarplatten-Methoden.

Zusätzliche Prüfungen, die in Wageningen durchgeführt wurden, zeigten, dass das Licht für die Ausbildung der Symptome oder manchmal für die Fruktifikation bestimmter Pilze wesentlich ist.

Die meisten Stationen verwendeten für den Ziegelgrustest roten Ziegelgrus; zwei Stationen verwendeten jedoch Vermiculite mit ziemlich guten Ergebnissen. Dies zeigt, dass auch andere Mittel angewendet werden könnten. Der rote Ziegelgrus hat den Nachteil, dass er dazu neigt, leichte Verfärbungen zu verursachen, ähnlich den Fusarien-Schäden, wofür der Test gemacht wird.

Forschungsprogramm. Es wurden Versuche an verschiedenen Objekten von vordringlicher Wichtigkeit vorgeschlagen; diese sollen von einigen der vertretenen Stationen ausgeführt werden. Folgende Themen wurden in diesem Zusammenhang diskutiert: Untersuchungen über den Einfluss von synthetischen Medien anstelle von natürlichen auf das Erscheinungsbild der Kolonien samenbürtiger Organismen. Untersuchungen über die Möglichkeit der Verwendung von "Peralite" anstelle von Ziegelgrus bei der Hiltner-Methode. Untersuchungen zur Erstellung von Routine-Methoden für die Erkennung des Befalles von Gloeotinia temulenta bei Raygras, "pasmo"-Befall bei Flachs und Ustilago nuda bei Gerste. Untersuchungen über das Vorkommen von samenbürtigen

Pilzen an Forstsamen und die Frage, ob es sich um Parasitimus oder Saprophytimus handelt.

Dem Wunsche einer Zusammenarbeit mit spezifischen Forschungsplänen und Spezialisten von samenbürtigen Nematoden sowie Viren und Bakterien wurde durch das Komitee beigepflichtet.

Das Handbuch für Gesundheitsprüfung von Samen. Dieses soll im Rahmen der ISTA publiziert werden. In einem geschlossenen Treffen diskutierte das Herausgeber-Unterkomitee über diesbezügliche Details. Es wurde entschieden, das Handbuch in zwei "Bände" oder "Serien" von Monographien zu unterteilen. Die erste Serie soll einen allgemeinen Überblick über die Literatur von samenbürtigen Krankheiten enthalten, während die zweite Serie der Handbuch-Monographien die einzelnen Krankheiten oder Methoden behandeln soll.

Die EPPO-Arbeitsgruppen für samenbürtige Krankheiten. Die Listen über wesentliche samenbürtige Krankheiten, die in den Berichten der EPPO-Arbeitsgruppen enthalten waren, u. zwar für samenbürtige Krankheiten an Saatgut der gemässigten Zone (Paris 1954) und an subtropischem und tropischem Saatgut (Paris 1958), wurden mitgeteilt. Befall für Befall wurde durchbesprochen. Die Liste der Spezialisten, die in Cambridge aufgestellt wurde, wurde durchgegangen und weitere Vorschläge für ein Programm der Zusammenarbeit mit Fachleuten, die an Krankheiten interessiert sind, gemacht, um nach Möglichkeit ausführbare routinemässige Standartmethoden vorzuschlagen.

Die Internationalen Regeln für Saatgutprüfung. Ein vorläufiger Antrag von Dr. J. de Tempe, sich mit den einleitenden Kapiteln der Abschnitte über Krankheiten in den Regeln zu befassen, erhielt allgemeinen Beifall. In weiteren Besprechungen wurde ein allgemeiner Wunsch für eine gründliche Revision der speziellen Teile dieses Abschnittes ausgedrückt.

Pläne für die Zukunft. Vergleichsprüfungen mit Gerste (Hordeum vulgare), Weizen (Triticum vulgare), Karotten (Daucus carota) und Erbsen (Pisum sativum) wurden vorgeschlagen.

Es wurde eine Zusammenarbeit mit der Planung der "associationwide"-Vergleichsprüfung für Keimfähigkeit verlangt und zwar wurde Medicago lupulina als dafür geeignet vorgeschlagen.

Die Konferenz-Teilnehmer billigten die Inangriffnahme eines Planes von vergleichenden Gesundheitsprüfungen subtropischer und tropischer Samen, die im mittleren Osten von Bedeutung sind, wie Zea mais und Oryza sativa.

Die Tagungs-Teilnehmer stimmten dem Forschungsprogramm über eine Anzahl von Problemen zu, welche die Entwicklung von Routine-Methoden für die Gesundheitsprüfung betreffen.

Weitere Zusammenarbeit zwischen dem Komitee für Pflanzenkrankheiten und anderen Organisationen wie die Europäische und Mediterrane Pflanzenschutzorganisation (EPPO) und die Organisation der Vereinten Nationen für Ernährung und Landwirtschaft (FAO) könnte erwartet werden.

Technische Hilfe wäre notwendig, um den praktischen Anforderungen dieser Verbindung zu genügen. Die Konferenz-Mitglieder stimmten zu, dem FAO Welt-Samenjahr volle Unterstützung zu gewähren.

Die Teilnehmer empfahlen, dass die nächsten Treffen wenn möglich in Beirut im Frühling 1960 und in Versailles im Mai oder Juni 1961 stattfinden sollten.